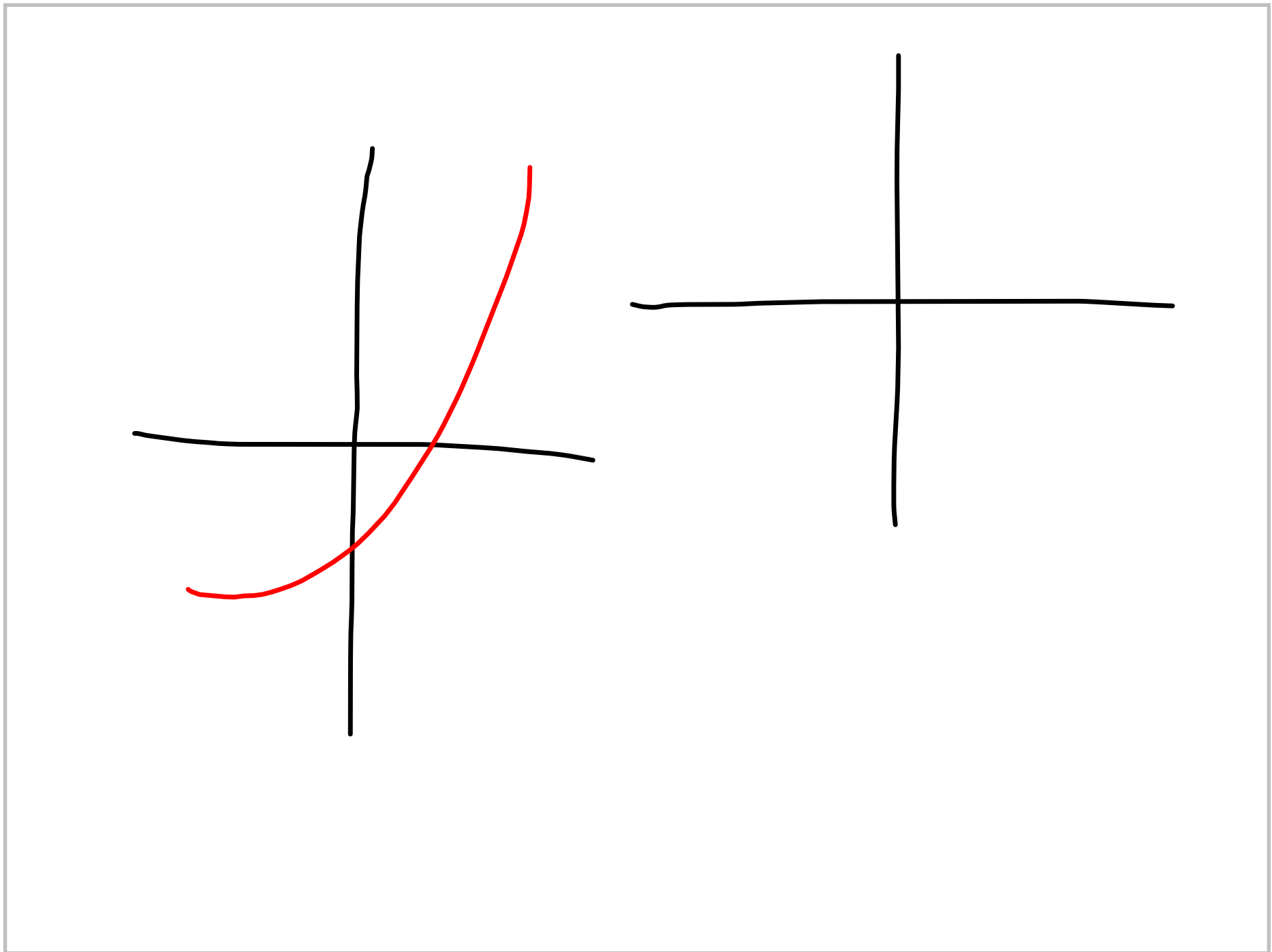


$$y=2^x \text{ and } y=3^x$$

Common features of graph.

- ① Same shape
- ② Never ^{cross} x -axis - Horizontal Asymptote
- ③ function always positive - above the axis
- ④ Same y -intercept $(0,1)$
- ⑤ one to one function - horizontal line test
- ⑥ goes to infinity
- ⑦ always increasing
- ⑧ inverse is a function



Differ

① $y=2^x$ is wider

② $y=3^x$ goes to infinity faster

$$y = -2^x$$

reflect over the x-axis

$$y = 2^{-x}$$

reflects
over y-axis

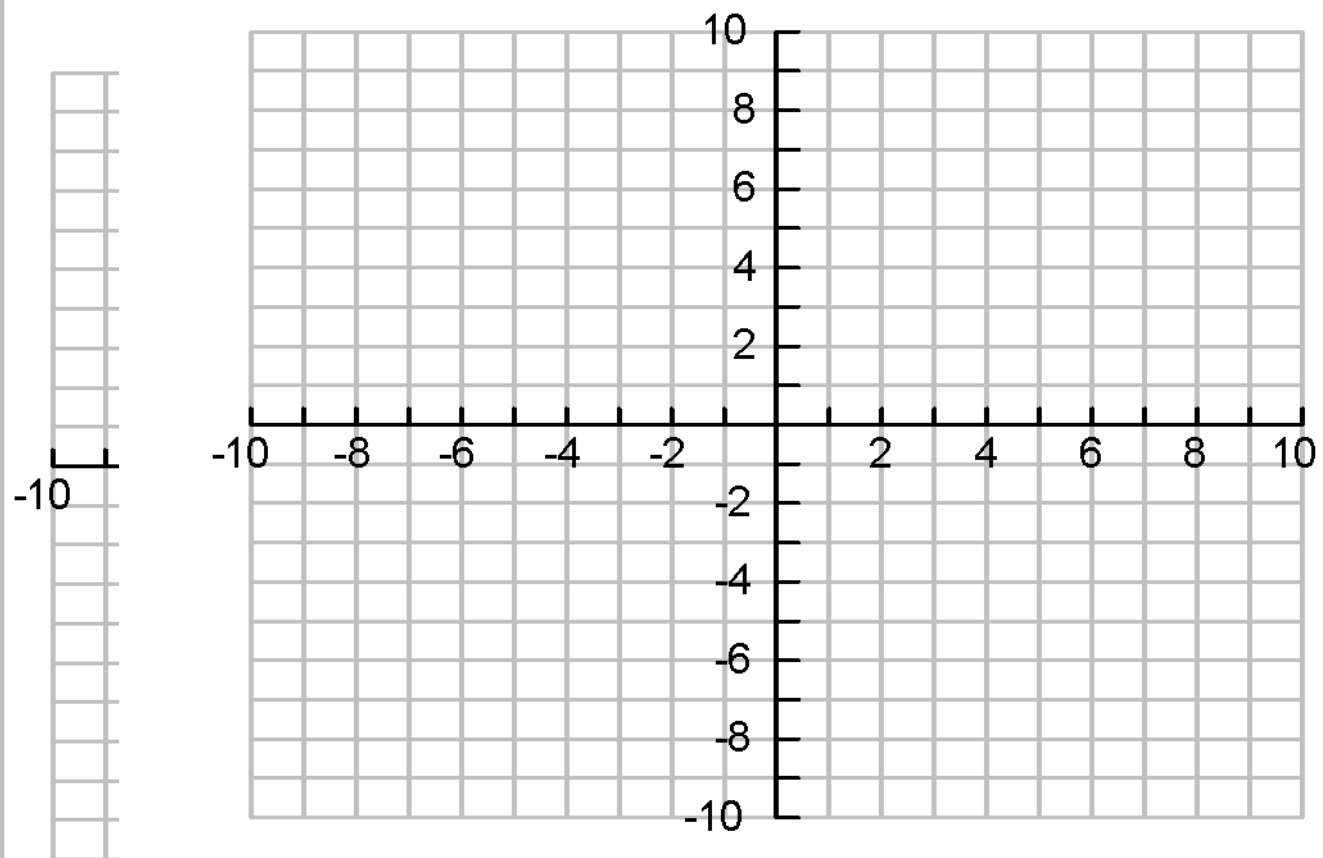
$$y = \sqrt{-x}$$

$$y = 2^x$$

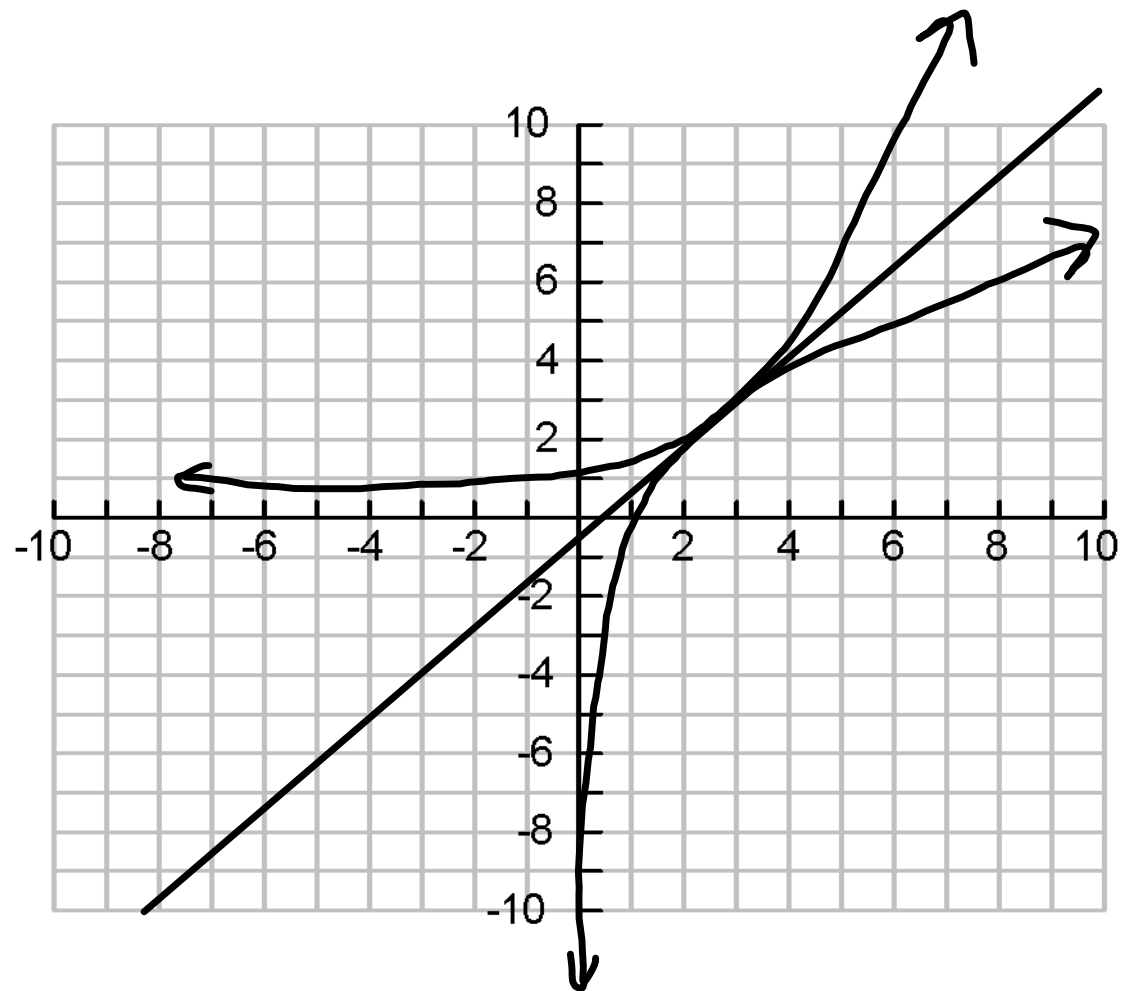
$$x = 2^{\textcircled{y}} \rightarrow \text{solve for } y.$$

$$y = \log_2 x$$

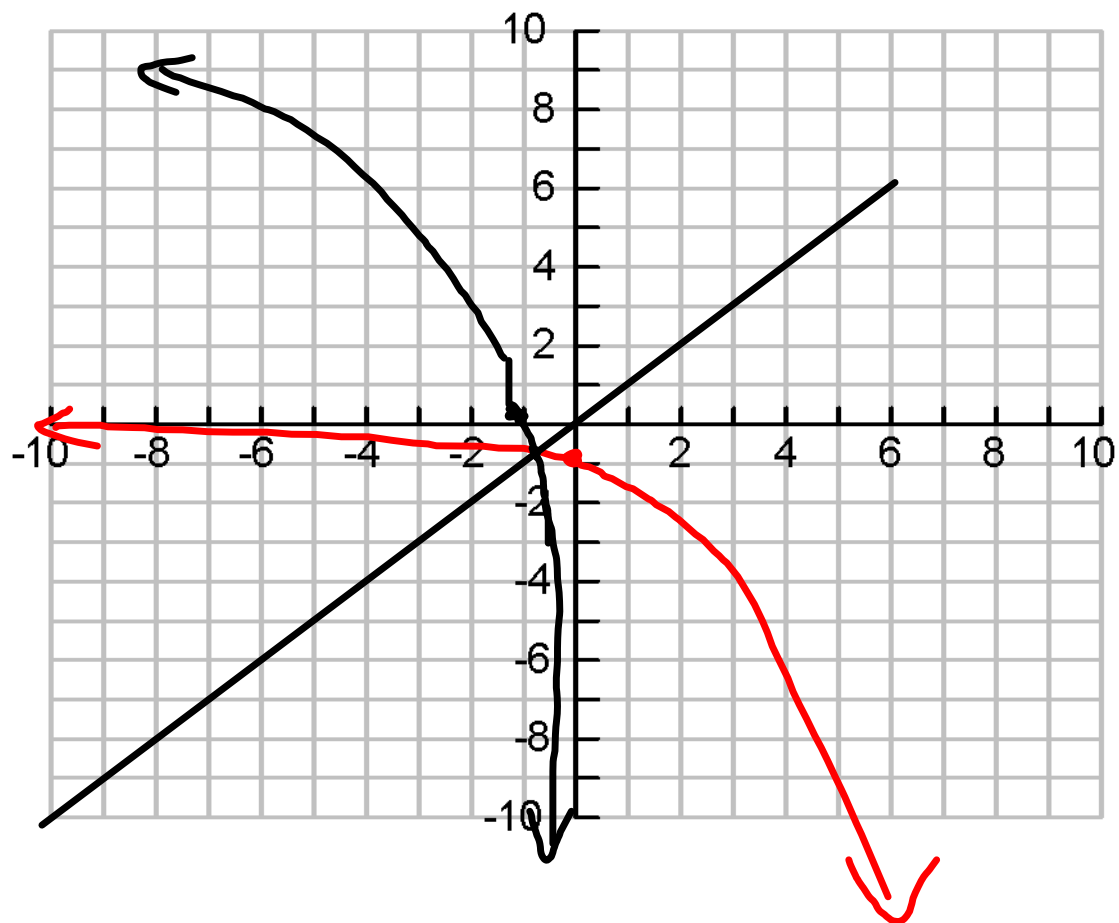
inverse function
of $y = 2^x$



$$= \log_2 x$$



$$y = -x$$



$$y = -2^x$$

$$x = -2^y$$

$$-x = 2^y$$

$$y = \log_2(-x)$$

$$y = \log x$$

understood
to have
a base of 10.

$$y = (-2)^x$$

Exponential Functions
base must be positive

$$y = -2^x$$

$$y = 2^x \underline{\underline{+ 1}} \text{ shift up one}$$

$$y = 2^{x+1} \text{ shift left one}$$

 exponent